

REMARKS

Claims 1-19 are pending in the application. Herein, applicant amends independent claims 1, 11, 12 and 19.

Section 102 Rejections

In the Office Action, the Examiner rejects claims 1-5, 8-9, 11, and 16-19 under 35 USC §102(b) as being anticipated by US patent no. 4,970,466 ("Bolles"). Each of the independent claims 1, 11, and 19 is discussed below.

Response to §102 Rejection of Independent claim 1.

The application traverses the rejection of claim 1 under §102, and respectfully submits that Bolles fails to disclose all the limitations of claim 1. To assist in clarifying the sequence of actions, claim 1 has been amended so that the launch controller expressly performs the steps of:

generating a sync signal for transitioning a duration signal to an "on" state;

waiting a known delay time after generating the sync signal; and
generating a launch signal on a cable after waiting the known delay;

As stated in the application as filed:

At a known time delay after generating the sync signal, the launch controller launches a pulse onto the cable. In this way, the duration signal has already transitioned to high before the launch signal is even applied to the cable. However, since the delay is known, the effect of the time delay may be removed in subsequent processing. Adding this known time delay enables the launch circuit and associated counter circuit to eliminate the effects of any dead zone. (Specification, pg. 17, Ins. 6-12).

According to the claimed sequence:

- 1) a sync signal is generated;
- 2) a duration signal is set to "on";
- 3) a "known delay time" is applied; and
- 4) a launch signal is generated on the test cable.

As further set out in claim 1, a counter is used to count the number of clock signals while the duration signal is "on". It is important to note that the duration signal is "on" before the launch signal is ever generated.

In sharp contrast, Bolles has a pulse generator 49 which generates the signal onto the test cable. This same signal is used by flip-flop 50 to start the counting process. Indeed, Bolles places this relationship as occurring "simultaneously". *Bolles, col. 11, lns. 57-63(duplicated below).*

tester 10 performs TDR by causing an incident electrical pulse to be generated and transmitted through cable driver 53 and relay 55 for transmission into CUT 18. Simultaneously, counter 77 begins counting cycles of the clock signal supplied by oscillator 75.

Thus, in Bolles, the pulse duration is counted "simultaneously" from when the signal is launched onto the cable under test. Stated differently, in Bolles, the signal that is transmitted down the CUT is the same signal that simultaneously initiates the counting process. Accordingly, Bolles does not disclose any duration signal set to "on" responsive to a sync signal, and does not generate a launch signal after waiting a known delay time from the sync signal.

Since Bolles fails to disclose all the limitation of claim 1, the applicant respectfully submits that claim 1, and dependent claims 2-5, and 8-9 are not anticipated by Bolles.

Response to §102 Rejection of Independent claim 11.

The applicant has amended claim 11 to make clear that the method uses a low-frequency clock signal. This low-frequency clock signal is selected even though it fails to "provide sufficient accuracy in any one measurement", and it is only through averaging many such low-accuracy measurements that an acceptable result is obtained. *See, Specification, pg. 11, lns. 15-22.* Indeed, using

only a 10 MHz clock signal, "it has been found that making many thousands of these low-resolution measurement and averaging the results provides a resolution of less than one foot of cable length." *Id.* Instead of using such a low-frequency clock, Bolles provides a 100MHz clock signal, which was selected so that "counter 77 exhibits sufficient timing precision to enable tester 10 to resolve the location of opens or shorts in CUT 18 to within two feet". Thus, Bolles fails to disclose the use of a low-frequency clock signal as claimed in claim 11.

Further, claim 11 requires more than about 1000 repetitions of the measurement cycle. In order to obtain sufficient resolution using the low-frequency clock, such a huge number of measurement cycles is required. In contrast, Bolles would find such a massive number of repetitions wasteful, as it already provides a much more accurate individual measurement due the high clock speed used. *See, Bolles, col. 18, lns. 7-17: ("The preferred embodiment permits a maximum of 30 iteration before ending the scan loop. However, this maximum number is not a critical parameter in the present invention so long as it remains substantially greater than 3")*. As can be seen from this cited section, Bolles 1) does not consider a large repetition number to be a critical parameter; 2) Teaches only that more than 3 repetitions should be used; and 3) sets a preferred number at only 30 repetitions. Thus, Bolles fails to disclose the use of a more than about 1000 repetition of the measurement cycle as claimed in claim 11.

Since Bolles fails to disclose all the limitation of claim 11, the applicant respectfully submits that claim 11, and dependent claims 16-18 are not anticipated by Bolles.

Response to §102 Rejection of Independent claim 19.

The application traverses the rejection of claim 19 under §102, and respectfully submits that Bolles fails to disclose all the limitations of claim 19. To assist in clarifying the sequence of actions, claim 19 has been amended so that that the launch controller expressly performs the steps of:

turning a duration signal to an “on” state;
waiting a known delay time after turning on the duration signal;
launching a launch signal on to a cable after the known delay time;

For similar reasons as set out in the “Response to §102 Rejection of Independent claim 1”, the applicant respectfully submits that Bolles fails to disclose all the limitations set out in claim 19. Since Bolles fails to disclose all the limitation of claim 19, the applicant respectfully submits that claim 19 is not anticipated by Bolles.

Section 103 Rejections

In the Office Action, the Examiner rejects claims 6-7, 10, and 12-13 under 35 USC §103(a) as being unpatentable over US patent no. 4,970,466 (“Bolles”).

Response to §103 Rejection of Claims 6-7, and 10

The applicant respectfully submits that the examiner will not be able to maintain a *prima facie* case of obviousness as to these claims as Bolles fails to teach, suggest, or disclose all the limitations of the rejected claims. As described in the “Response to §102 Rejection of Independent Claim 1” section, Bolles fails to disclose all the limitations of independent claim 1, and therefore also fails to disclose all the limitations of dependent claims 6-7, and 10.

There is also no motivation to modify claim 1 according to Bolles. Bolles teaches a TDR that initiates a counter simultaneously with transmitting a signal down a cable under test. In this way, Bolles suffers from the “dead zone” issues as described in the specification. *See, Specification, pg. 3, ln. 18 to pg. 4, ln. 3.* In order to minimize the dead zone effect, Bolles implements a rather complex process for attempting to measure a cable length when a “quick trip” was identified, and acknowledges the “relatively low probability of detecting such short in any single scan.” *See, Bolles, col. 15, lns. 28-36.*

In contrast, the system of claim 1 uses an entirely different theory of operation to address a “quick trip” or the “dead zone” problem. As set out in the claim, the duration signal is set to “on” a known time before generating the launch signal. This sequential relationship elegantly addresses the dead zone issue, without the need for the processes and circuitry described in Bolles. There would be no motivation to modify the claimed invention according to Bolles, as Bolles and the claimed invention use entirely different theories of operation.

Since Bolles fails to disclose all the limitations for the rejected claim, and there is no motivation to make the required modifications, the applicant respectfully submits that Bolles fails to render claims 6-7, and 10 obvious.

Response to §103 Rejection of Claims 12-13

Claim 12 has been amended to set out that the measurement cycle is repeated about 25 thousand times. *See, Specification, pg. 12, ln. 22.*

Claims 12 and 13 each depend from independent claim 11, which is now believed to be in a condition for allowance. Accordingly, the applicant respectfully submits that claims 12 and 13 are allowable as being dependant from an allowable claim.

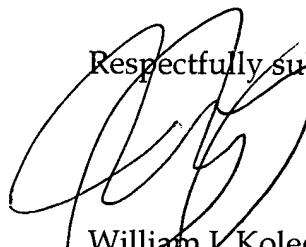
Response to §103 Rejection of Claims 14-15

In the Office Action, the Examiner rejects claims 14 and 15 under 35 USC §103(a) as being unpatentable over US patent no. 4,970,466 (“Bolles”) in view of US patent no. 6,075,833 (“Leshay”).

Claims 14 and 15 each depend from independent claim 11, which is now believed to be in a condition for allowance. Accordingly, the applicant respectfully submits that claims 14 and 15 are allowable as being dependant from an allowable claim.

CONCLUSION

Applicant respectfully submits that pending claims 1-19 are now in a condition for allowance. If the Examiner would find it useful, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

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